

This application is a continuation of U.S. Patent Application No. 09,486,423, filed October 20, 1999 (now U.S. Patent No. 6,433,036, issued August 13, 2002), which is the U.S. National phase entry of International Patent Application No. PCT/US98/03819, filed February 26, 1998, which is a continuation-in-part of U.S. Patent Application No. 08/805,193, filed February 27, 1997 (now U.S. Patent No. 5,922,783, issued July 13, 1999). --

Replace the paragraph at page 1, line 11 with:

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Cyanacrylates generally are quick-setting materials which cure to clear, hard glassy resins, useful as sealants, coatings, and particularly adhesives for bonding together a variety of substrates [see e.g., H.V. Coover, D.W. Dreifus and J.T. O'Connor, "Cyanoacrylate Adhesives" in Handbook of Adhesives, 27, 463-77, I. Skeist, ed., Van Nostrand Reinhold, New York, 3rd ed. (1990)].

Replace the first four lines of page 7, beginning at line 1 with:

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where R_1 and R_2 may be the same or different and may occur at least once and up to as many as four times on each ring in the event of a five-membered ring and up to as many as five times on each ring in the event of a six-membered ring;

Replace the paragraph at page 9, line 10 with:

And bis-alkylmetallocenes, for instance, bis-alkylferrocenes (such as diferrocenyl ethane, propanes, butanes and the like) are also desirable for use herein, particularly since about half of the equivalent weight of the material (as compared to a non-bis-metallocene) may be employed to obtain the sought-after results, all else being unchanged. Of these materials, diferrocenyl ethane is particularly desirable.

Replace the first sixteen lines of page 10, beginning at line 1 with:

BS
"IRGACURE" 184 (1-hydroxycyclohexyl phenyl ketone), 907 (2-methyl-1-[4-(methylthio)phenyl]-2-morpholino propan-1-one), 369 (2-benzyl-2-N,N-dimethylamino-1-(4-morpholinophenyl)-1-butanone), 500 (the combination of 1-hydroxy cyclohexyl phenyl ketone and benzophenone), 651 (2,2-dimethoxy-2-phenyl acetophenone), 1700 (the combination of bis(2,6-dimethoxybenzoyl-2,4,4-trimethyl pentyl) phosphine oxide and 2-hydroxy-2-methyl-1-phenyl-propan-1-one), and 819 [bis(2,4,6-trimethyl benzoyl) phenyl phosphine oxide] and "DAROCUR" 1173 (2-hydroxy-2-methyl-1-phenyl-1-propane) and 4265 (the combination of 2,4,6-trimethylbenzoyldiphenyl-phosphine oxide and 2-hydroxy-2-methyl-1-phenyl-propan-1-one); and the visible light [blue] photoinitiators, dl-

camphorquinone and "IRGACURE" 784DC. Of course, combinations of these materials may also be employed herein.

Replace the paragraph bridging pages 17 and 18, beginning at page 17, line 25 with:

The composition-coated substrate may be positioned within an electromagnetic radiation curing apparatus, such as the "ZETA" 7200 ultraviolet curing chamber, equipped with an appropriate source of electromagnetic radiation, such as ultraviolet radiation, at an appropriate distance therefrom, such as within the range of about 1 to 2 inches (2.54 to 5.08 cm), with about 3 inches (7.62 cm) being desirable. As noted above, the composition-coated substrate may remain in position or may be passed thereunder at an appropriate rate, such as within the range of about 1 to about 60 seconds per foot, with about 5 seconds per foot being desirable. Such passage may occur one or more times, or as needed to effect cure of the composition on the substrate. The length of exposure may be in the range of a few seconds or less (for one time exposure) to tens of seconds or longer (for either a one time exposure or a multiple pass exposure) if desired, depending on the depth of the composition to be cured and of course on the components of the composition themselves.

Replace the paragraph at page 18, line 12 with:

The reaction product of the photocurable composition may be prepared by dispensing in low viscosity or liquid form a photocurable composition in accordance with the present invention onto a substrate and mating that substrate with a second substrate to form an assembly. Thereafter, exposure to electromagnetic radiation on at least one substrate of the assembly for an appropriate period of time should transform the photocurable composition into an adhesive reaction product.

Replace the first five lines of page 25, beginning at line 1 with:

formed therefrom. Each of these formulations (i.e., Sample Nos. 7-10) was allowed to cure completely for a period of time of about 24 hours after initial exposure to ultraviolet light. The shear strength of the reaction products formed from those cured formulations is represented in Table 2b.

Replace the paragraph bridging pages 26 and 27, beginning at page 26, line 37 with:

The formulations were then applied to acrylic substrates, both of the UV absorbing and the UV transmitting type. The formulations were applied to two sets of test piece specimens in triplicate of both UV absorbing acrylic substrates and UV transmitting acrylic substrates, which were

mated to form test piece assemblies. The so-formed assemblies were then positioned in the UV curing chamber and exposed to UV radiation for the following time periods: about 1, 2 and 5 seconds. Thereafter, the test piece assemblies were maintained at ambient temperature conditions for a period of time of about 1 to 3 minutes and shear strength measurements of each test piece assembly were determined using the Instron Universal tester, as described in Example 1, supra. The second set of triplicate specimens was allowed to cure further at ambient temperature conditions for a period of time of about 24 hours. Failure in these specimens may occur due either to substrate failure (e.g., substrate fracture), cohesive failure (e.g., where a portion of the photocurable composition separates due to the applied force on surfaces of both substrates) or adhesive failure (e.g., where the composition separates due to the applied force on a surface of one substrate).

Replace the paragraph at page 31, line 24 with:

B¹⁰
In Table 3, Cp₂ represents dicyclopentadienyl and Py₂ represents bis(2-pyridyl). In addition, to the ethyl-2-cyanoacrylate has been added about 50 ppm of BF₃ and about 1000 ppm of hydroquinone to minimize premature anionic polymerization and free-radical formation, respectively.

Replace the paragraph at page 32, line 7 with:

The induction time and peak max time is the time of UV exposure required to induce a photo-curing reaction and to reach a reaction maximum, respectively. These data are measured by onset and peak time of the reaction enthalpy (or exothermic photo-curing reaction). Higher enthalpy indicates the sample has a greater reactivity. Of course, a faster curing sample will have a shorter induction time, a peak max time and a higher enthalpy. For example, Sample 11 required 1.1 seconds of such UV exposure to induce UV curing, 4 seconds to reach a UV curing reaction maximum and generated 164 J/G of exotheric heat.

Replace the paragraph at page 35, line 9 with:

B¹²
In addition, with respect to tubesets, intravenous sets, fluid delivery and withdrawal sets (such as drug delivery and blood withdrawal sets) and suction tubes are but a few examples of tubesets for the medical industry which may be manufactured with the composition of this invention.

IN THE CLAIMS:

Please amend Claims 1, 11, 13-14 and 20-21 to read as follows and cancel Claims 2 and 3, without prejudice or disclaimer of that which was defined thereby. A marked-up version of Claims 1, 11, 13-14 and 20-21, showing the changes